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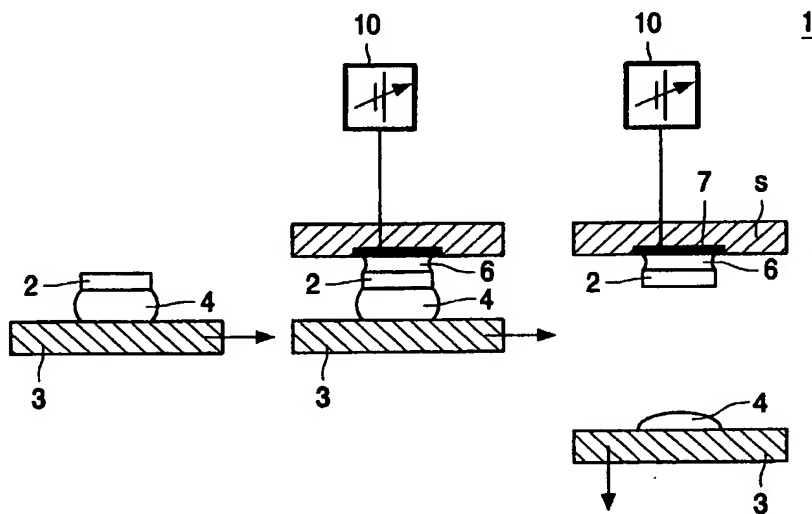
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[Continued on next page]

(54) Title: MANIPULATION OF OBJECTS WITH FLUID DROPLETS



(57) Abstract: A system for manipulation of an object comprises a carrier (3) to transport the object (2) to a substrate to receive the small object. A fluid droplet (4,6) which couples the object (2) detachably to the carrier (3) and/or to the substrate (5). The coupling of the object (2) to the fluid droplet (6) relative to the coupling of the fluid droplet (6) to the substrate (5) is electrically controlled on the basis of the electrowetting effect.

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Declaration under Rule 4.17:

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GR, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK,

EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

Internu pplication No
PCT/IB 03/05255

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H01L21/68 B65H5/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H01L B65H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 02/063678 A (MORF THOMAS ; IBM (US)) 15 August 2002 (2002-08-15) page 4, line 22 - line 25 page 7, line 1 - line 6 page 8, line 4 - line 9 page 9, line 9 - line 11 -----	1-4,6,7
A	US 2002/036055 A1 (YOSHIMURA TETSUZO ET AL) 28 March 2002 (2002-03-28) paragraphs [0119], [0120], [0136] - [0139], [0155] - [0157]; figures 5h-5m -----	1,2,5
A	PATENT ABSTRACTS OF JAPAN vol. 0081, no. 27 (E-250), 14 June 1984 (1984-06-14) -& JP 59 040543 A (HITACHI IRUMA DENSHI KK; others: 01), 6 March 1984 (1984-03-06) abstract -----	1,2,5

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

Int'l application No.
PCT/IB 03/05255

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
see FURTHER INFORMATION sheet PCT/ISA/210
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-7, 9

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-7,9

A system for manipulation of a semiconductor substrate comprising a carrier, a substrate, a fluid droplet and a semiconductor substrate.

2. claim: 8

A system for manipulation of a semiconductor substrate , comprising a pick up plate, a feeding plate, and a device substrate each one carrying droplets, and a placing plate with several electrodes. The feeding plate and the placing plate being coupled by a joint.

3. claims: 10,11

A method of manipulation of a semiconductor substrate having a carrying side with high wettability and a target side with low wettability, placing said semiconductor substrate with its low wettability side on a carrying fluid droplet on a carrier; bringing said carrier with the semiconductor substrate with its high wettability side into contact on deposition area on a substrate; moving the carrier away from the substrate.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.1

The person skilled in the art would readily use the system claimed in claim 1 in order to put in his contact lenses: A system comprising : A finger top to transport a contact lens, an eye ball to receive the contact lens and a tear/water droplet which couples the contact lens detachably to either the eye ball and /or the finger top. Due to the extremely vague drafting of the first claim it has been decided to limit the scope of the search based on the definition of a small object as being "a semiconductor substrate used in an electronic component" given on page 1: lines 1-9 of the application document.

INTERNATIONAL SEARCH REPORT

Information on patent family members

Intern: .pplication No
PCT/IB 03/05255

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 02063678 A	15-08-2002	EP 1358673 A1	05-11-2003
		WO 02063678 A1	15-08-2002
		US 2004154733 A1	12-08-2004
US 2002036055 A1	28-03-2002	JP 2001274528 A	05-10-2001
JP 59040543 A	06-03-1984	NONE	